

WHAT IS CLAIMED IS:

1. A semiconductor device having a plurality of MOSFETs where a source region, a drain region and a channel forming region are formed in a semiconductor substrate, respectively,

5 wherein impurity regions of a conductive type opposite to that of said source region and said drain region are disposed locally in a channel width direction on a junction portion of said drain region within said channel forming region.

10 2. A device according to claim 1, wherein each of said impurity regions comprises a region including impurities of the conductive type opposite to that said drain region with a concentration higher than that of a region in which said impurities are undoped in said channel forming region.

15 3. A device according to claim 1, wherein elements selected from Group XIII and XV are contained with a concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

20 4. A device according to claim 2, wherein elements selected from Group XIII and XV are contained with the concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

5. A device according to claim 1, wherein elements selected from Group XIII and XV are contained with a concentration of 1×10^{16} to 5×10^{17} atoms/cm³ in said semiconductor substrate.

5 6. A device according to claim 2, wherein elements selected from Group XIII and XV are contained with the concentration of 1×10^{16} to 5×10^{17} atoms/cm³ in said region in which said impurities are undoped.

10 7. A device according to claim 1, wherein the width of said impurity regions in the channel width direction is set as 0.05 to 0.3 μm .

15 8. A device according to claim 1, wherein said impurity regions are disposed at intervals of 0.04 to 0.6 μm .

9. A semiconductor device having a plurality of MOSFETs where a source region, a drain region and a channel forming region are formed in a semiconductor substrate, respectively,

20 wherein said channel forming region comprises impurity regions and undoped regions; and

wherein said impurity regions of a conductive type opposite to that of said source region and said drain region and said undoped

regions are alternately disposed on a junction portion of said drain region within said channel forming region along said junction portion.

10. A device according to claim 9, wherein each of said impurity
5 regions comprises a region including impurities of the conductive type opposite to that said drain region with a concentration higher than that of said undoped region.

11. A device according to claim 9, wherein elements selected
10 from Group XIII or XV are contained with a concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

12. A device according to claim 10, wherein elements selected
15 from Group XIII or XV are contained with the concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

13. A device according to claim 9, wherein elements selected
from Group XIII or XV are contained with a concentration of 1×10^{16} to 5×10^{17} atoms/cm³ in said undoped region.

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14. A device according to claim 10, wherein elements selected
from Group XIII or XV are contained with the concentration of 1×10^{16} to 5×10^{17} atoms/cm³ in said undoped region.

15. A device according to claim 9, wherein the width of said impurity regions in the channel width direction is set as 0.05 to 0.3 μm .

5 16. A device according to claim 9, wherein said impurity regions are disposed at intervals of 0.04 to 0.6 μm .

17. A semiconductor device having a plurality of MOSFETs where a source region, a drain region and a channel forming region are
10 formed in a semiconductor substrate, respectively,

 wherein impurity regions of a conductive type opposite to that of said source region and said drain region are disposed locally in a channel width direction on a junction portion of said drain region within said channel forming region, and

15 wherein said semiconductor device is an electric device selected from the group consisting of a personal computer, a portable informing terminal device and a car navigation system.

18. A device according to claim 17, wherein each of said impurity
20 regions comprises a region including impurities of the conductive type opposite to that said drain region with a concentration higher than that of a region in which said impurities are undoped in said channel forming region.

19. A device according to claim 17, wherein elements selected from Group XIII and XV are contained with a concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

5 20. A device according to claim 17, wherein elements selected from Group XIII and XV are contained with a concentration of 1×10^{16} to 5×10^{17} atoms/cm³ in said region in which said impurities are undoped.

10 21. A device according to claim 17, wherein the width of said impurity regions in the channel width direction is set as 0.05 to 0.3 μm .

22. A device according to claim 17, wherein said impurity regions
15 are disposed at intervals of 0.04 to 0.6 μm .

23. A semiconductor device having a plurality of MOSFETs where a source region, a drain region and a channel forming region are formed in a semiconductor substrate, respectively,

20 wherein said channel forming region comprises impurity regions and undoped regions,

wherein said impurity regions of a conductive type opposite to that of said source region and said drain region and said undoped regions are alternately disposed on a junction portion of said drain

region within said channel forming region along said junction portion,
and

wherein said semiconductor device is an electric device
selected from the group consisting of a personal computer, a portable
5 informing terminal device and a car navigation system.

24. A device according to claim 23, wherein each of said impurity
regions comprises a region including impurities of the conductive type
opposite to that said drain region with a concentration higher than
10 that of said undoped region.

25. A device according to claim 23, wherein elements selected
from Group XIII or XV are contained with a concentration of 1×10^{17}
to 5×10^{19} atoms/cm³ in said impurity regions.
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26. A device according to claim 23, wherein elements selected
from Group XIII or XV are contained with a concentration of 1×10^{16}
to 5×10^{17} atoms/cm³ in said undoped region.

20 27. A device according to claim 23, wherein the width of said
impurity regions in the channel width direction is set as 0.05 to 0.3
μm.

28. A device according to claim 23, wherein said impurity regions are disposed at intervals of 0.04 to 0.6 μm .

29. A method of manufacturing a semiconductor device,
5 comprising the steps of:

laminating a gate insulating film and a gate electrode on a semiconductor substrate;

adding impurities from an oblique direction with respect to said semiconductor substrate; and

10 forming a source region, a drain region and a channel forming region in a self-aligning manner with said gate electrode as a mask;

wherein impurity regions of a conductive type opposite to that of said source region and said drain region are formed under said
15 gate electrode locally in a channel width direction.

30. A method according to claim 29, wherein elements selected from Group XIII or XV are added with a concentration of 1×10^{17} to 5×10^{19} atoms/ cm^3 in said impurity regions.

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31. A method according to claim 29, wherein a width of said impurity regions in the channel width direction is set as 0.05 to 0.3 μm .

32. A method according to claim 29, wherein said impurity regions are disposed at intervals of 0.04 to 0.6 μm .

33. A method according to claim 29, wherein said semiconductor
5 device is an electric device selected from the group consisting of a personal computer, a portable informing terminal device and a car navigation system.

34. A method of manufacturing a semiconductor device,
10 comprising the steps of:

laminating a gate insulating film and a gate electrode on a semiconductor substrate;

adding impurities from an oblique direction with respect to said semiconductor substrate; and

15 forming a source region, a drain region and a channel forming region in a self-aligning manner with said gate electrode as a mask;

wherein impurity regions of the conductive type opposite to that of said source region and said drain region are formed under said
20 gate electrode at one or several positions at intervals along a channel width direction.

35. A method according to claim 34, wherein elements selected from Group XIII or XV are added with a concentration of 1×10^{17} to 5×10^{19} atoms/cm³ in said impurity regions.

5 36. A method according to claim 34, wherein a width of said impurity regions in the channel width direction is set as 0.05 to 0.3 μm .

37. A method according to claim 34, wherein said impurity
10 regions are disposed at intervals of 0.04 to 0.6 μm .

38. A method according to claim 34, wherein said semiconductor device is an electric device selected from the group consisting of a personal computer, a portable informing terminal device, and a car
15 navigation system.